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ORIGINAL

December 16, 2009

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DEC 16 2009

Federal Communications Commission
Office of the Secretary

Marlene H. Dortch, Secretary
Office of the Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

RE: NBP Public Notice #17
GN Docket Nos. 09-47, 09-51, 09-137
WC Docket No. 02-60

Dear Ms. Dortch:

Intel respectfully submits two copies of its ex parte comments in response to the FCC's request for comments on health care delivery elements of the National Broadband Plan. We thank you for this chance to share our experience with broadband and health information technologies. As the FCC continues to develop the National Broadband Plan, Intel would be eager to provide its help again in the future.

If I can answer any questions regarding these comments or other matters, please do not hesitate to contact me.

Sincerely,

Alice Borrelli

Alice Borrelli
Director
Global Healthcare and Workforce Policy
Intel Corporation
202-626-4393

041

EX PARTE FILING

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)
	) **GN Docket Nos. 09-47, 09-51, 09-137**
Health Care Delivery Elements of National Broadband Plan	) **WC Docket No. 02-60**

COMMENTS—NBP PUBLIC NOTICE # 17

Comments of Intel Corporation

December 16, 2009

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Health Care Delivery Elements of National Broadband Plan	)	**WC Docket No. 02-60**

EXECUTIVE SUMMARY

Intel Corporation (Intel) hereby submits the following comments in response to the Notice of Inquiry in the above-captioned proceeding. Intel, the world leader in silicon innovation, develops technologies, products, and initiatives to continually advance how people work and live.[1] Intel has a long history of supporting public policies that promote ubiquitous, affordable, high-quality broadband in the United States (U.S.) and around the world. Intel is committed to America's global competitiveness and has years of experience working to advance universal broadband and personal computer (PC) ownership.

Intel also has a strong commitment to bring together broadband and health care technologies. In 2008, Intel teamed with General Electric Healthcare to commit $250 million for the development of wireless technologies that can link patients and physicians. Intel has been at the industry forefront in its development of home health care technologies, such as the Intel Health Guide, which allows for remote patient monitoring. The Intel Health Guide combines an in-home patient device, the Intel Health Guide PHS6000, with the Intel ® Health Care

[1] Additional information about Intel is available at www.intel.com/pressroom and http://blogs.intel.com/policy.

Management Suite, an online interface that allows clinicians to monitor patients and remotely manage care. Intel's health care technologies seek to limit errors and costs through the elimination of paper-based workflows, better care management of chronic diseases, and remote monitoring of an aging population.

Intel has previously commented on Notices of Inquiry related to the development of the National Broadband Plan, as well as broadband stimulus funding under the American Recovery and Reinvestment Act (ARRA). Again, Intel is eager to share its experience in developing and using broadband and health information technologies as the FCC seeks to include health care delivery elements within the National Broadband Plan.

In these comments, Intel selected two counties to illustrate the potential of telehealth and remote patient monitoring and the barriers that prevent communities from achieving maximum connectivity to benefit patients, providers, and the overall health care system. By examining Medicare data from 2007, Intel calculated the potential savings in these counties for patients with asthma, congestive heart failure, chronic obstructive pulmonary disease (COPD), diabetes, and hypertension had remote patient monitoring been used. Telehealth produces real savings and promises patient independence, but these benefits cannot be achieved unless the broadband infrastructure needed to support its use is deployed and in place—much of which will need to be wireless. Additionally, Intel believes a Medicare reimbursement policy that supports the incorporation of telehealth and remote patient monitoring as a health system option, where appropriate for the patient, is needed. Without such a reimbursement methodology, telehealth adoption will be hindered, and the greatest return on infrastructure investments will not be realized.

1.0 Defining the Network Architecture for Health Care Delivery Through a Connected Care Platform

The convergence of disruptive demographics, economies, and technologies offers an opportunity to deliver care differently to seniors and chronic disease patients who need affordable and real time access to education and treatment.

- Disruptive Demographics: By 2025, there will be double the number of seniors, and by 2050, an estimated 22 percent of the world's population—nearly 2 billion people—will be 60 or older. As the world has aged, chronic diseases have surpassed communicable diseases as the major cause of death and disability worldwide. Cardiovascular diseases, diabetes, obesity, cancer and respiratory diseases now account for 59 percent of the 57 million deaths worldwide annually. In addition, two-thirds of the workforce also serve as part-time caregivers, and there is a growing shortage of care professionals (nurses, pharmacists, primary care providers, etc.). Almost half of the health care workforce was 45 years or older by 2008, and the health care labor shortage is expected to last through 2050. It should also be noted that the shortage of providers hits rural areas particularly hard.

- Disruptive Economies: Health care costs are projected to rise to 20 percent of Gross Domestic Product (GDP) or $4 trillion in 8 years from $2.2 trillion. The U.S. is facing a growing budget deficit, and individuals are increasingly without insurance, savings, or a pension.

- Technologies: Individuals are able to wear wireless sensor networks and use Web 2.0 personal software/services. Powerful, affordable microprocessors are also available. From fall prevention to technology aides for independent living, the potential for offering real time health care applications is here.

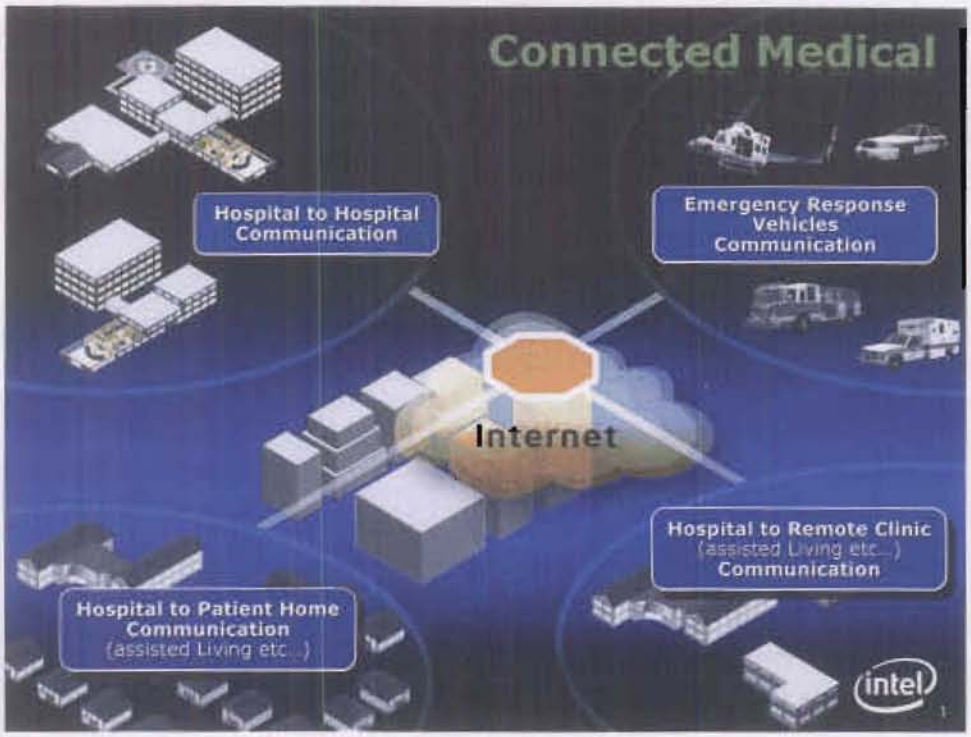
Intel has studied these three factors and understands how these factors converge together. With this knowledge, Intel has invented a number of technologies to address these health care needs and continues to develop devices and technology that meet the changing needs of the population. Intel's diverse research teams include social scientists, designers, physicians, and engineers. We begin with ethnographic fieldwork, observing and interviewing people where they live, work, and play and identify the key needs and values that motivate people to adopt technology and shape the ways they might use it. Intel uses the methods of social science to figure out appropriate action in response to trends and opportunities. While technology alone

cannot make people better, it can clearly help health care professionals make better decisions, be more effective in their day, and monitor patients more intensively.

Intel has conducted case studies of hospitals that have reduced their mortality rates, reduced medical errors, and reduced their average length of stays through use of technologies, such as active radio-frequency identification (RFID) for patient/asset tracking, automated pharmacy dispensing, electronic intensive care unit (ICU) monitoring, and more. On the personal side, research demonstrates that people with a strong sense of connection to their support system (family, neighbors, community) get healthy faster and stay healthy longer. Technology that helps people track their medical conditions, automatically creates graphs and recommendations, and communications to doctors/nurses can provide more effective treatment. Intel is currently conducting research on the use of sensors, communications assistance, and other products to help people maintain their social networks. Fortunately, technologies are becoming available today that enable patients, health care providers, and family caregivers to connect, communicate, and share information for optimal results.

1.1 Health IT Architecture – Designing for Reliability

Building the connected health information technology (health IT) network for multiple users on a public platform is not unlike building a network in a hospital. The IT architecture of every node of the healthcare infrastructure must ultimately be considered to optimize performance and cost. In this discussion the 'nodes' of the infrastructure for IT can reside in as the hospital, clinic (we combine clinics with physicians), emergency medical responders (ambulance service, fire department, etc.), long-term care facilities, and the home.



As part of the optimizations, factors such as safety, data security, platform security, and maintainability must be considered when measuring the robustness of the network architecture. The speed of the network is important for safety reasons as well as to ensure the bandwidth headroom to move data from source to destination in a prescribed timeframe. Many traditional technologies for remote health care require 60 kbsec service or less. This type of load could easily be handled by the Plain Old Telephone Service (POTS). This level of service, however, will not be sufficient to ensure safety and efficiency in technologies that are quickly being developed for more effective forms of care.

Since the very basic requirement of the healthcare network will include everything from transferring large data sets of images to supporting real time video, the speed demands of the network will inevitably extend one to two orders of magnitude greater than the POTS speed requirements. If the support is real time, then depending on the frame rate, a 200K bits/sec to 2 megabits/sec network connection will be required for the home connection. A bi-directional channel of this level must be set up if the health care provider must be seen by the patient in the home.

If the node being considered is within a clinic, then the compression for any real time video will require lossless compression standards. This is required because of real time analysis of medical images. The clinic node would typically require 2-4 megabits/sec. Eventually, the electronic medical responders (EMR) will need the bandwidth of the clinic as more care is expected in the mobile emergency setting. This also will allow the mobile clinics to flourish ultimately, lowering the cost of service to some rural communities.

For the wireless portion of the infrastructure, special consideration must be given to ensure reliability. One way to address this issue is redundancy. To guarantee a certain Quality of Service (QoS), each node should be able to choose the service level required and have access to two different technologies supplying high speed links to increase the probability of obtaining a connection. For example, 3G and WiMax wireless links would be available at each node. If the primary link could not be accessed, the backup network could be attempted. This would increase the probability of access given weather or capacity issues. For the highest level of reliability, it could be recommended the node have a POTS line modem available to enable a 'call for help' in the event all connections are down.

Common Connection Models in Healthcare

Connection	Comments	Data Types	Target Bandwidth
Hospital to Hospital	Information flow from hospital to hospital within the same provider network	Patient records, XRAYs ~100kb – 10MB, Cat-scans/MRI data (3D, 4D, 5D) ~ 20-150 MB, multiple video conferences	50- 500 Mbps
Hospital (or medical clinic) to Patient Home Communication (Telemedicine)	Information flow from clinical care provider to patient in the home or in a skilled nursing facility or assisted living facility.	Video conferencing, biometric data, behavioral data, ADL information, PERS	2-5 Mbps
Ambulance to Hospital (or medical clinic) Communication	Information flow from mobile emergency vehicle to hospital	Video conferencing, biometric data (EKG, BP, pulse, etc.), patient medical data	2-5 Mbps
Hospital to Remote Clinic or Pharmacy (assisted living, etc..) Communication	Information flow from hospital to remote clinics	Patient records, XRAYs, Cat-scans, MRI data, biometric data, video conferencing	2-10 Mbps

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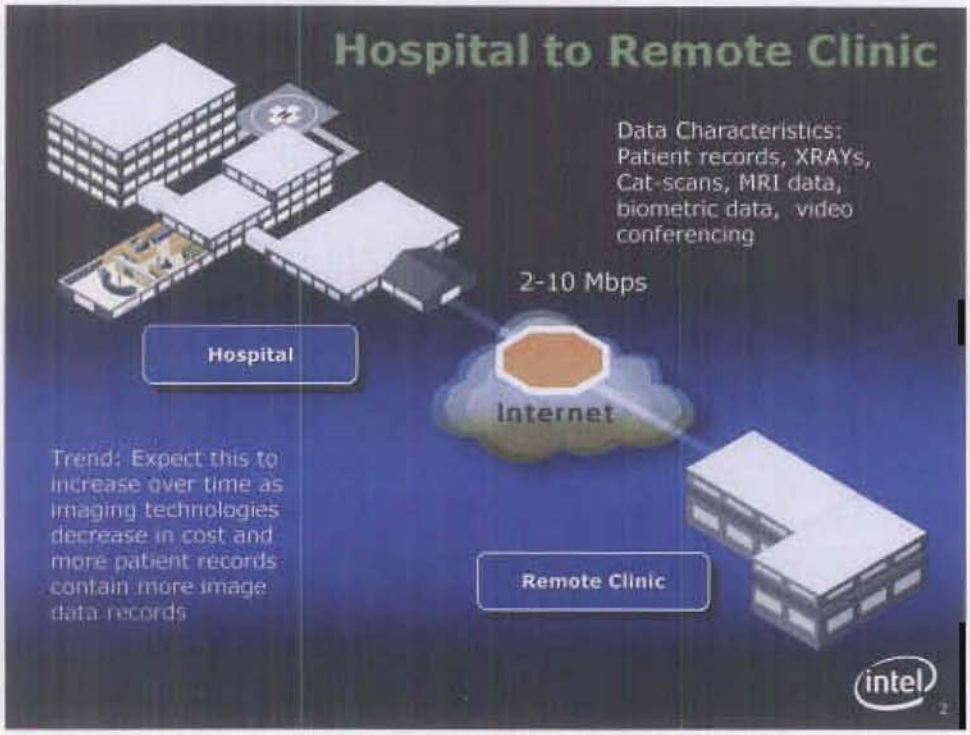
1.1a Hospital to Remote Clinic

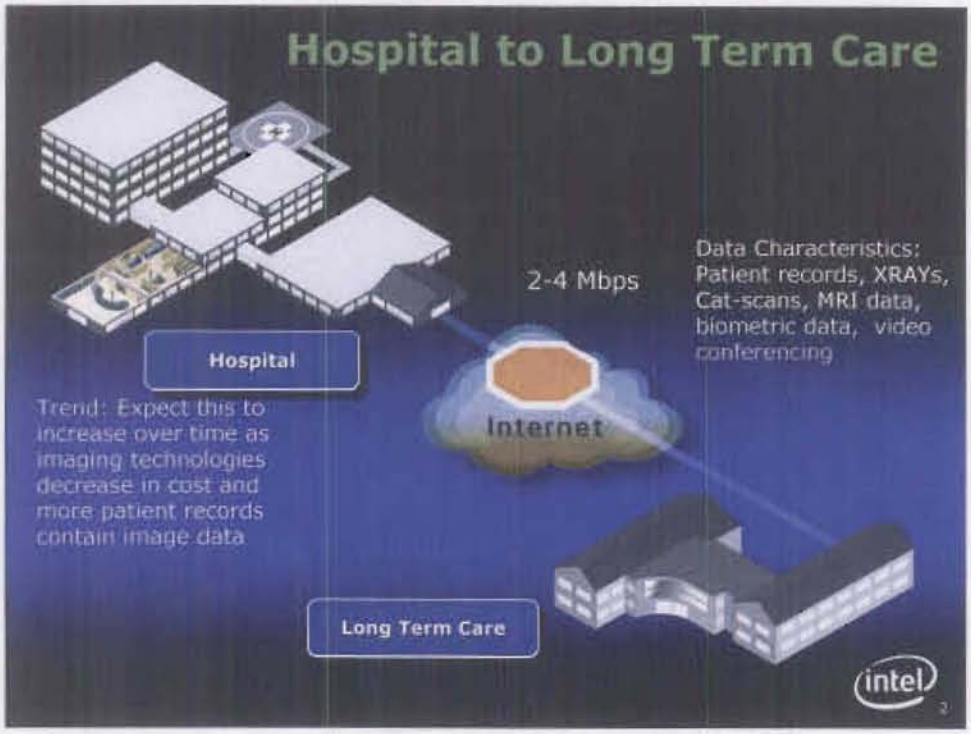


- Characteristics:
  - One of more physicians in the location
  - Consultation with major specialists
  - Routine problem analysis
  - Video feed into clinic faster than up link requirements
  - Function of diagnostic equipment – how expansive
  - Asynchronous communications more common – sending/receiving large data files for patient records not real time
  - Access to cable or DSL is often available, if not antennas can be large allowing tower distances to be greater

- Concerns:
  - Level of training and type of practice determines how the typical bandwidth requirements will vary

- IT Network support of the nodes and platform security

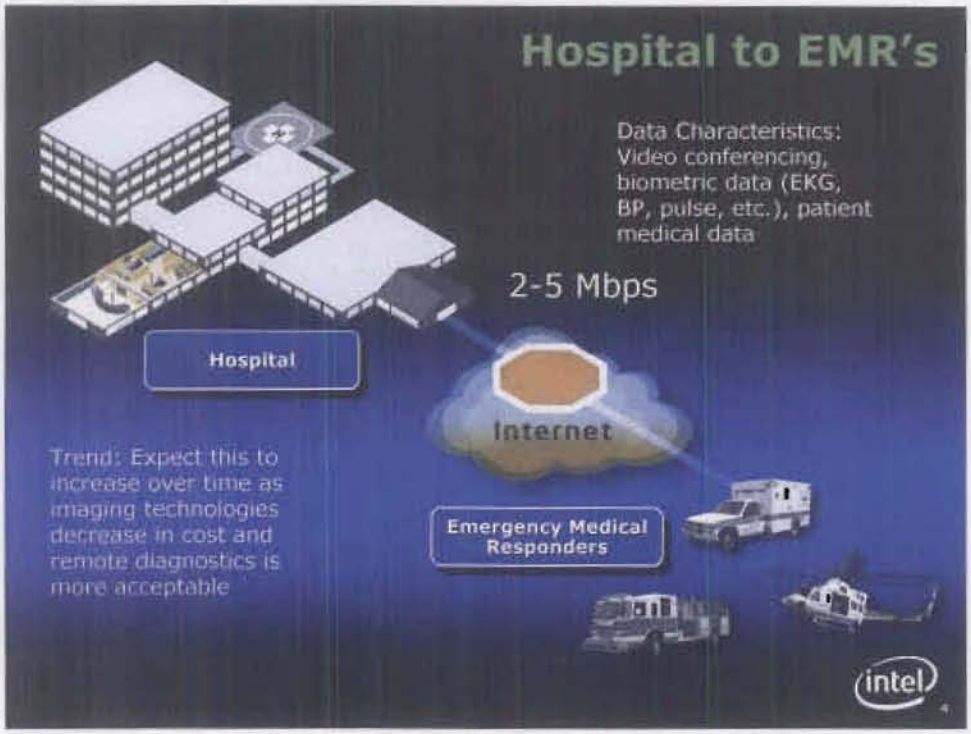
1.1b Hospital to Long-Term Care Facilities



- Characteristics
  - Continuous monitoring availability for some patients
  - Consultation with major specialists
  - Routine problem analysis
  - Inbound data requirements are greater than outbound – this would be for training purposes and other information
  - Not too many imaging devices
  - Social communication proven to improve outcome so typical low bandwidth speed to connect to relatives, others
  - Large antenna possible so transferring to tower easier – towers can be further apart

- Concerns
  - With the success of the at home care model, more acute care patients will move into this facility forcing higher bandwidth on a per facility basis

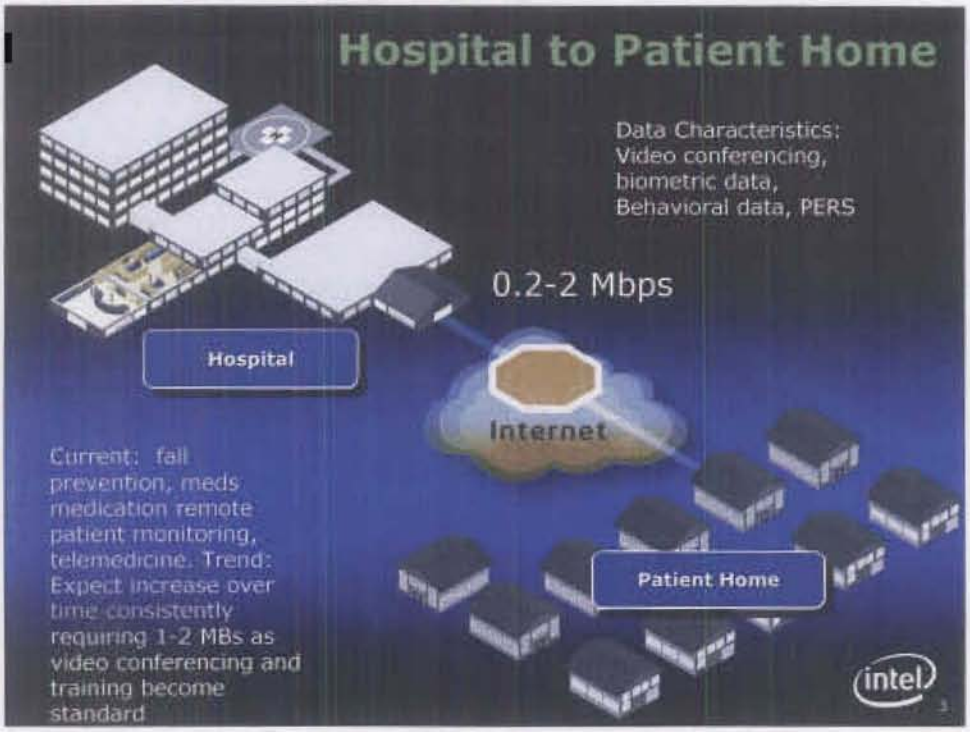
1.1c Hospital to EMR



- Characteristics
  - Mobile connection is required
  - Real time and synchronous communications is required
  - Quality of Service (QoS) is vital
  - Minimum latency to hospital
  - Diagnostic tools are limited
  - Large outgoing lossless data required
  - Large antenna possible so transferring to tower easier so towers can be further apart
  - Similar characteristics to clinic – could be used as a mobile clinic lowering overall health costs by moving clinic to the locations

- Concerns
  - More availability will drive up demand
  - Asset tracking/management --- Privacy and others
  - Soft updates and delivery important
  - Clustering of units QoS must be maintained where data could be continuous (4 EMR at same location sending ultrasound could be a 8 Megabit stream of data)

1.1d Hospital to Home



- Characteristics
  - Sufficient bandwidth offers to be cost efficient and scaleable Larger transmit antenna could add flexilbity and lower costs that can allow for longer distance towers in rural areas
  - Lossy data transmission allows for lower speeds 200kb – 2 Mbits since video conferencing allows for lossy signaling. Once MRI data and other more detailed data need to be transmitted through up and down links, the bandwidth will need to accommodate.

- Concerns
  - QoS levels need flexibility to change status based upon patient needs
  - Since installations can cost 10 to 15 % of the service, provisioning (truck rolls) need easy access and scalability to deploy technology
  - Redundancy for personal emergency response
  - Billing – for ISP's – confusing and contain many inaccuracies for end-to-end service for patient that leaves hospital and goes to home.
  - Ensure that the platform is restricted to the appropriate health care software, i.e., no gaming on the devices by the grandchildren.

Hospital to Home

Connection	Comments	Bandwidth
Broadband	• Bandwidth: Typical DSL has a fixed bandwidth assigned to each customer. • Stability: predictable and stable 24X7	• Cable ~30 Mbps • DLS ~10Mbps • VDSL ~30Mbps • ADSL ~2Mbps • SDSL ~3Mbps • HDSL ~2Mbps
Cellular 3G	• Bandwidth: Max bandwidth shared by all active users making upload/download speeds unpredictable. • Stability: not stable for bandwidth or connection quality. • Tower providers use different algorithms • Provider use different algorithms to kill quite connections	• The maximum speed is 2.4 Mbps on the download link and 153.6 kilobits per second on the upload link. • Total max bandwidth of 2.4 Mbps are to be shared by all users within a single cell sector. One cell normally has 3 sectors to cover the full 360 degrees area around a cell antenna tower.
Cellular 4G	• An all IP, packet switched network	• At least 100 Mbps while the client physically moves at high speeds relative to the station • 1 Gbps while client and station are in relatively fixed positions
POTS	• Analog lines, also referred to as POTS (Plain Old Telephone Service), support standard phones, fax machines, and modems. These are the lines typically found in your home or small office. • Low Bandwidth and no mobile capability • Analog signals have size limitations as to how much data they can carry	• 180 Hz to 3.2 kHz

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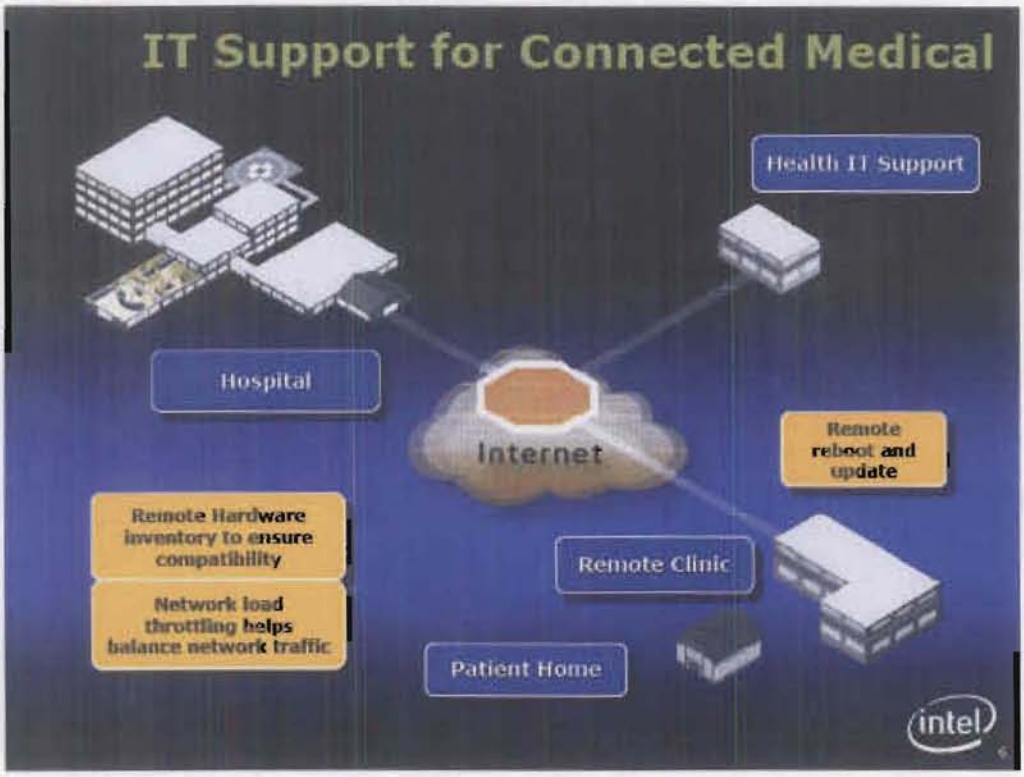
1.2 IT Support for Connected Medical Networks

IT support for any Connected Medical network must be considered to ensure a robust and consistent network solution. Hardware management solutions such as Active Management Technology (AMT) allows maintenance and debugging of the nodes remotely even if the node is powered down or has crashed. This important feature existing in the hardware allows

external IT to provide updates and even ensure calibration of the node without disturbing the application. This mechanism can also support the amount of data sent over the network to enable load balancing if necessary.

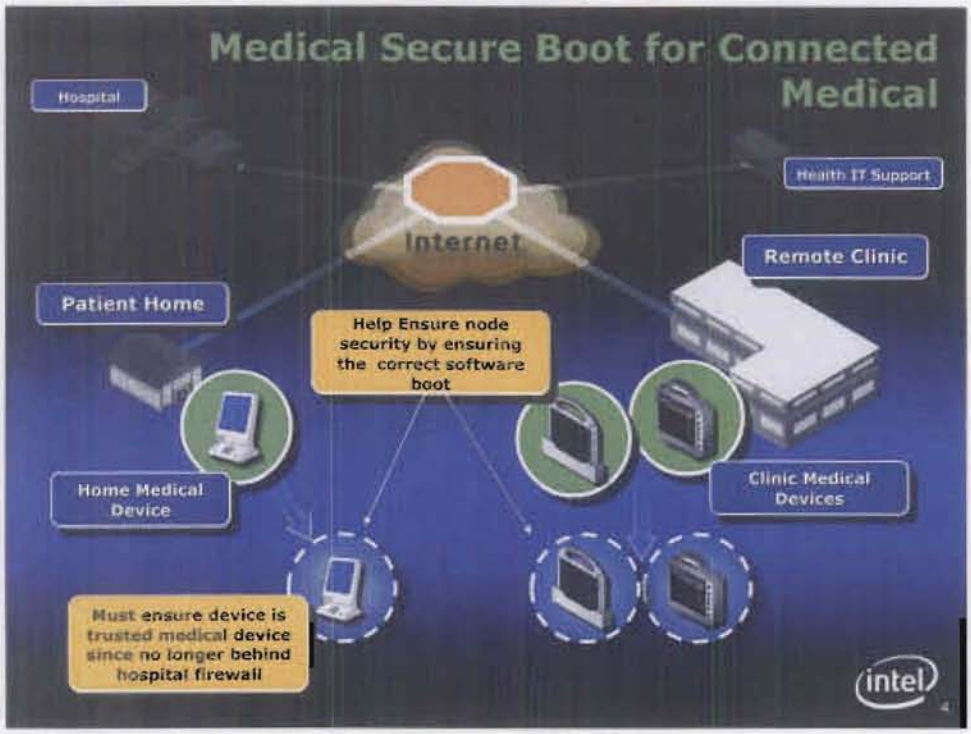


As the Connected Medical network is more fully deployed and more nodes are in less secure settings, the requirements may be made to determine if the node that is supplying data is physically secure and indeed the node expected. The Trusted Execution Technology (TXT), is one example of a solution to support this protection. This hardware solution helps ensure that when the device boots it only starts the OS that the manufacturer intended. A useful application on a healthcare device could be ensuring the OS has not been modified and that the correct version of OS is running on particular nodes.

1.3 Summary of Network Requirements

- *Special health device network not required*
  - By using redundancy and some of the technologies of controlling traffic on network, this solution will likely be cheaper and more cost effective to maintain.

- *Technology exists today that will extend another 10 years*



  - Utilizing 4G technologies like WiMax provide the most flexibility of deployment and service and as even as a redundant carrier ensures that two different technologies will increase reliability.

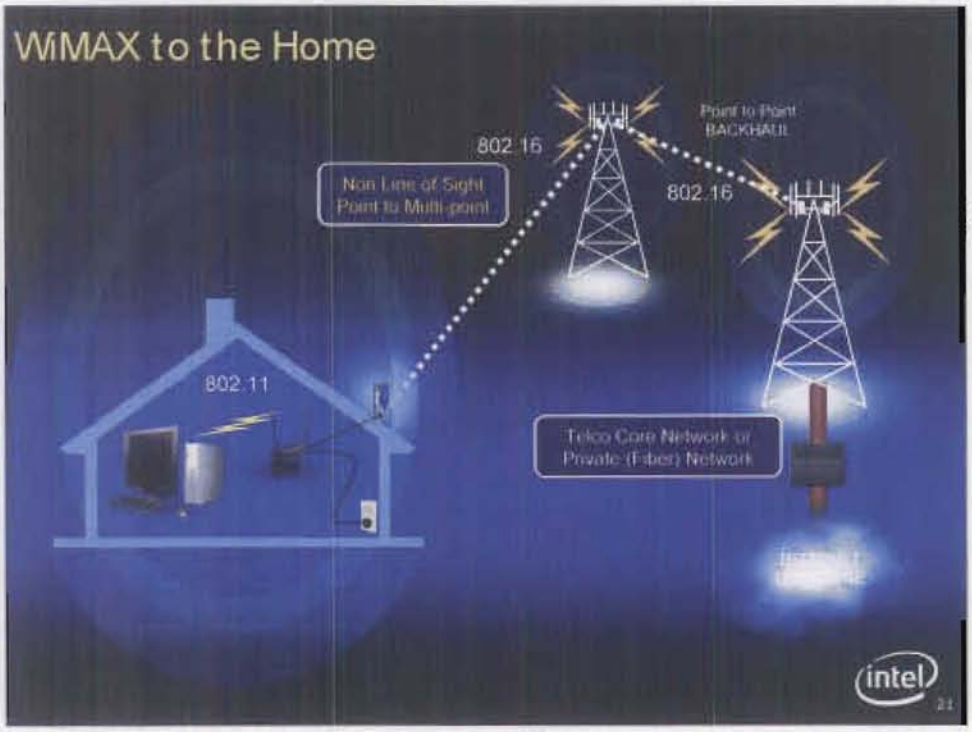
- *Application Specific Deployment for medical advantage*
  - Given that the medical network will typically have the ability to have a bigger fixed antenna supporting up to 3-4 km distance between towers, cost savings could result from deploying 4G technologies like WiMAX in the early years.

- *Remote support required*

- Aberrant computers can be fixed or removed from the network ensuring no excess traffic – Advance Management Technology from Intel provides this ability.

- ***Ensure Correct Software is running on connected device***
  - As the market expands, ensuring the correct node secure boot is vital. Technology such as Trusted Execution Technology from Intel can ensure that when the system boots up it starts out running what was intended in the 'Trusted' environment.

1.4 Wi-Max to the Health Home - Does it Work?



Pilots were conducted in Ireland (connected seniors to monitoring systems, with the use of motion detectors, indoor camera surveillance (conditional), and outdoor camera surveillance) and Portland, Oregon (motion detectors, door switches, and touch screens). Overall, the results from these pilots were positive. The pre-provisioning of systems dramatically cut down the installation time on-site (down from 1.5 hours to 22 minutes average). WiMax carriers also made scaling easier to many sites, system maintenance was simplified, and

billing was more accurate and scaleable based upon IP Modem addresses allowing systems to move with the patient. Challenges included a combination of weather changes and topology that affected signal reception of the home systems, and carriers would install updates causing unknown loss connection.

4G solutions, such as WiMAX, will have 5 to 10 times the performance of 3G solutions. 3G solutions (HSPA, EVDO) do not have sufficient performance to reliably provide full broadband internet access required to meet basic video conferencing requirements. WiMAX can easily support 3-6mbps sustained with +10 mbps burst download speeds with 1-2 MBs uplink speeds.

While WiMAX is a shared bandwidth technology, specific enhancements enable WiMAX service providers to allocate roughly 40 mbps for shared peak downlink transfers and 20 mbps for shared peak uplink transfers. WiMAX service providers also have the ability to prioritize classes of traffic, such as health care applications and services, to ensure bandwidth availability for the most critical services. Most US WiMAX network deployments are designed to support 3-6mbps downlink and +1mbps uplink data services for all users, thus exceeding basic requirements for home and remote clinic health care video conferencing applications.

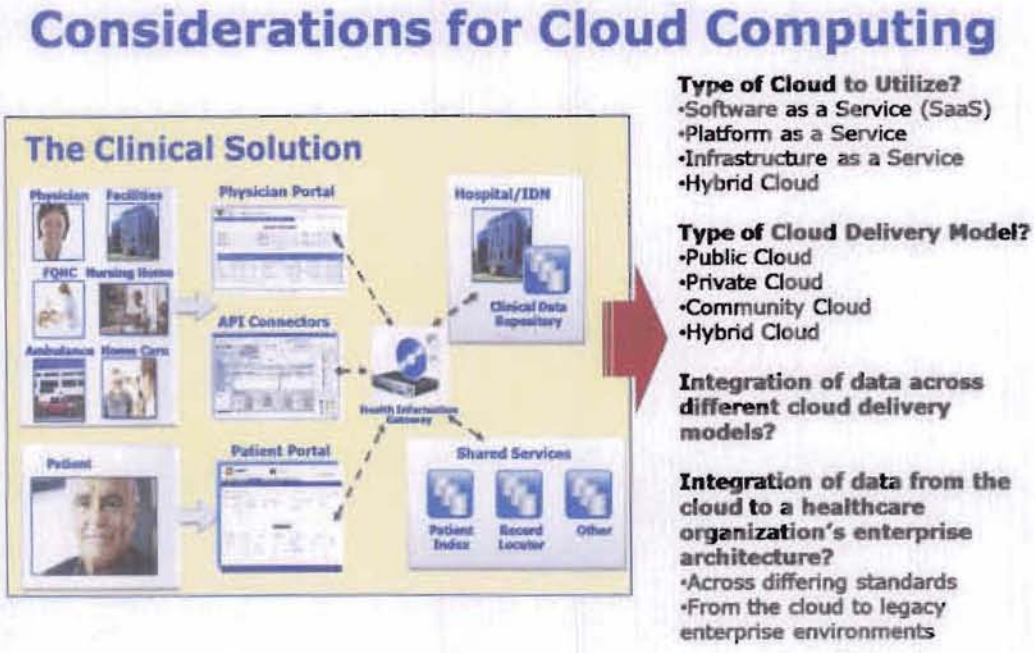
1.5 Cloud Computing

Intel believes cloud computing is a rapidly evolving area that offers the potential for many industries to increase flexibility and efficiency. With cloud computing, services and data are provided by shared computing resources in scalable data centers and are accessible over the Internet. This produces key benefits because services are easily available on demand and can rapidly scale both up and down as required by an organization.

Current delivery models include: (i) providing applications within the cloud (known as software as a service); (ii) providing application development tools within the cloud (referred to as platform as a service); and (iii) offering virtualized computing capabilities (known as infrastructure as a service).

Cloud services within health care are still immature, with important concerns left to be addressed. Health care organizations need to ask key questions when developing a cloud computing strategy including: (i) how will this strategy best support the organization's mission during this time of change; (ii) which services should be moved to the cloud; and (iii) how can the organization integrate its existing and/or evolving enterprise architecture with cloud compute options. Organizations supporting health IT applications must have confidence in their ability to exercise the same level of control over security, governance and SLAs for cloud delivered applications as they can with conventional on-site application architectures.

Health care organizations will need to evaluate how to demonstrate meaningful use when utilizing different cloud delivery models. Achieving data interoperability and meeting security requirements between clouds and between clouds and legacy enterprise architectures will also be challenged. Some organizations are responding to these challenges by establishing "private clouds" for their mission-critical services. This approach will provide a health care organization with more benefits and fewer risks. *However, adoption of common standards will still be required to ensure data interoperability externally among organizations.*



The FCC has requested feedback on the relative value of hosted (ASP, Software as a Service, or Cloud Computing) solutions versus client-based offerings. Intel believes there are three primary advantages where hosted solutions provide greater value than client-based offerings.

The first two advantages focus on the economic benefits derived by health care organizations as users of cloud services. As the consumer of these services, health care organizations will benefit by paying for compute power and services only as they are used. In addition, health care organizations using cloud services provided by another hosted environment will reduce their own internal IT maintenance and management burden. The last advantage identified by Intel is directed to the cloud solution provider. A lower total cost of ownership is realized by the cloud hosting provider due to economies of scale achieved through network, storage, and compute resource pooling.

Intel believes the internet connectivity speed needed in the future for individuals to effectively manage their health from home and communicate with health care practitioners utilizing cloud solutions will depend on the type of cloud solutions used. As an example, a public cloud model will require that users have access to network connectivity sufficient for their desired application and service level requirements. In this model, restrictions on network bandwidth are anticipated with less control over the quality of service. This model may not be suitable for certain categories of applications that require a very strict quality of service. For a private cloud model, the restrictions of network bandwidth are removed because the organization can exercise control over all aspects of the network, including applications, security, and quality of service.

1.6 Role of the Federal Government

The Federal Government's role should be one of innovator, cheerleader, and integrator. Through the ARRA grant programs, health care reform initiatives, the National Broadband Plan, and the leadership of various agencies, the resources to impact new forms of care delivery are taking shape. To maximize these resources, the Federal Government should

focus on specific communities, both rural and underserved, to coordinate technology solutions that will reach those in need through the most efficient and comprehensive services.

The Beacon Communities Program announced December 2nd by Secretary of HHS, Kathleen Sebelius, and the National Coordinator of HIT, David Blumenthal, will provide grants to 15 communities to accelerate and demonstrate the ability of HIT to transform local health care systems and improve the lives of Americans and the performance of the health care providers who serve them. Under the program, $220 million in grants will be available for communities that are already building HIT infrastructures, implementing health information exchanges, and have higher EHR provider adoption rates than the national average. The grant funding will be available to build and strengthen these HIT infrastructures and health information exchange capabilities. An additional $15 million will be provided for technical assistance to the communities and to evaluate the success of the program.

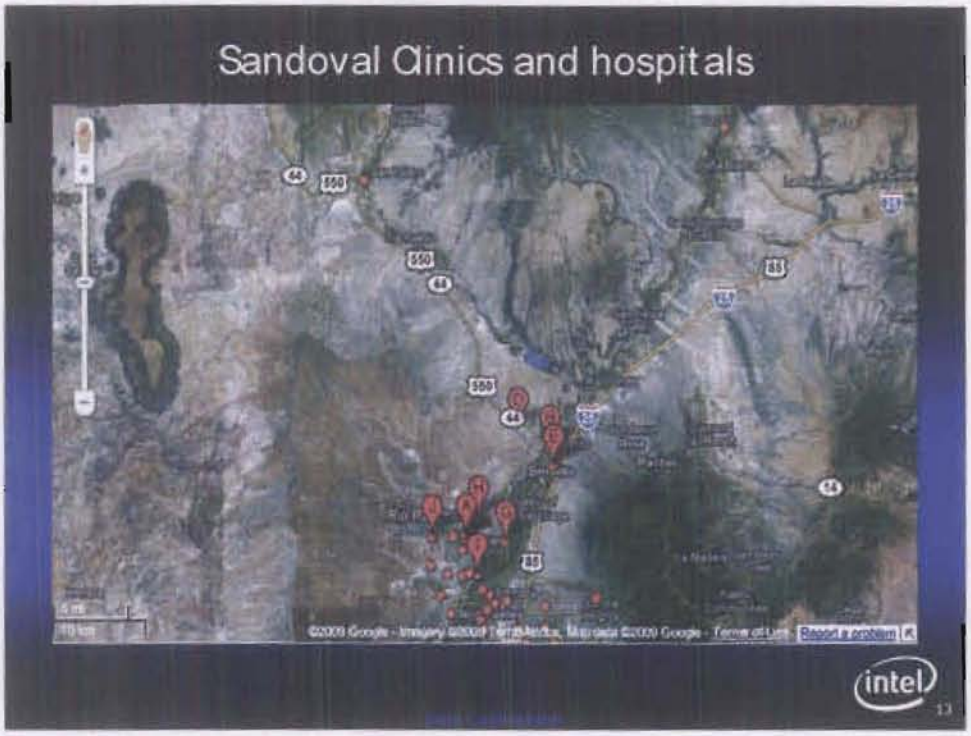
2.0 IT Infrastructure to Support Health Care Delivery: Description of Two Community Projects

To illustrate the broadband connectivity requirements needed for full integration of a community's health care system, Intel chose to analyze the existing broadband capacity in two locations and assess the infrastructure still needed to transform these communities into broadband-enabled health care delivery systems. Intel selected two communities with varying access challenges. These communities are Sandoval County, New Mexico and Marion/Polk Counties in Oregon.

Sandoval County, New Mexico has a population of 89,908. Within Sandoval County, the three prominent ethnic groups are: Caucasians (45,198); Hispanics (26,426); and Native Americans (14,480). Of the 31,411 households reporting, 29,598 had phone service.[2] American Indian and Alaska Native persons: In Sandoval County, approximately 13.5 percent of the county's population of 122,298 are American Indian or Native Alaskans (from 2008 US Census Population Estimates).

[2] Centers for Disease Control and Prevention, SNAPS Data, http://emergency.cdc.gov/snaps/data/35/35043.htm.

Seven clinics are located within Sandoval County, but there are no hospitals within 50 miles. The following map depicts the clinic locations.



2.1 Chronic Care Patients in Sandoval County, New Mexico

Based on data from the 2007 Medicare Analysis and Review (MEDPAR) file, which contains records for 100 percent of Medicare beneficiaries who use hospital inpatient services, Intel determined the number of individuals discharged from hospitals within 50 miles of Sandoval County in 2007 with the following conditions: asthma; chronic heart failure; coronary obstructive pulmonary disease, diabetes, and hypertension. If an individual has more than one chronic disease (e.g., diabetes and hypertension), this will be reflected in both the diabetes and hypertension patient counts. However, the unduplicated totals will only count this individual once. Although the discharge data includes residents of both Sandoval County and neighboring communities, the chronic disease patients treated in 2007 totaled 5,631 with 64 percent of individuals returning to their homes.

The MEDPAR data for hospitals within 50 miles of Sandoval County shows the following patient counts for these five conditions:

New Mexico – Hospitals Within 50 Miles of Select Zip Codes

Conditions	Patient Count	Patients Discharged Home/self care (routine charge)	Percent Discharged Home/self care (routine charge)
Asthma	414	277	67%
CHF	1,919	1,095	57%
COPD	911	520	57%
Diabetes	1,466	907	62%
Hypertension	1,286	806	63%
Unduplicated Total	**5,631**	**3,605**	**64%**

Source: Dobson | DaVanzo Analyses of Center For Medicare and Medicaid Services (CMS), Medicare Provider Analysis and Review (MEDPAR) File for 2007

The total Medicare reimbursement for these patients in 2007 was $53,557,071 or $9511 per patient.

Target Conditions in New Mexico Hospitals Within 50 Miles of Selected Zip Codes

Conditions	Patient Count	Total Charges	Covered Charges	Reimbursement Amount
Asthma	414	$9,278,627	$9,181,961	$3,371,782
CHF	1,919	$57,315,390	$57,146,481	$18,275,114
COPD	911	$25,231,115	$24,941,007	$9,430,799
Diabetes	1,466	$40,597,556	$40,324,533	$14,106,120
Hypertension	1,286	$32,626,819	$32,477,823	$11,513,544
Unduplicated Total	**5,631**	**$155,670,789**	**$154,744,176**	**$53,557,071**

Source: Dobson | DaVanzo Analyses of Center For Medicare and Medicaid Services (CMS), Medicare Provider Analysis and Review (MEDPAR) File for 2007

According to studies conducted by the Department of Veterans Affairs, technologies to the home can be significantly successful in reducing the number of hospital bed days and the number of readmissions for patients with chronic care disease. Based on this one year expenditure, if only 30 percent of the patients returning to their homes could take advantage of remote care to avoid hospital readmissions, **Medicare spending could be reduced as much as $2 million each year.**

Chronic care hospitalizations	%Patients Returning Home	# of patients returning home	% remote patient monitoring	# of patients connected	20% hospital readmissions prevention
5631	64%	3603	30%	1081	216

While the FCC may want to work with industry and providers to refine these calculations, the underlying fact remains that the potential for savings should drive an intense effort to determine how best to keep seniors and patients with chronic disease out of the hospital and in the comfort of their homes.

2.2 Sandoval County Broadband - Penetration and Requirements for Health Care Applications

To create a model of telecare for Sandoval County, New Mexico, the County's coverage of wireless broadband was overlaid on the distribution of various clinics and hospitals in the County. Most of the County has sufficient coverage for an IT communication model between hospitals and clinics and for clinic to clinic communications.

Unfortunately, however, Sandoval County lacks the broadband penetration to offer sufficient health care applications for many of the County's chronically ill patients who would require videoconferencing. From information readily available, Intel believes there is sufficient coverage throughout the County for all homes to have dial up coverage allowing for communication between the homes and hospitals. Although the dial up coverage would provide transfer of biometric and behavioral data from the home to clinics or hospitals, the next step towards enriched applications would require additional bandwidth (assuming the DSL coverage may be limited forcing the home communication model to rely on 3G). Given the topography of most of the County, a 4G technology plan would offer the most efficient solution for the in-home patients.